

Listing of Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Previously Presented) A treatment system comprising:
a point of entry;
a liquid reservoir having an inlet fluidly connected to the point of entry, and an outlet;
an electrochemical device comprising a first compartment with a first compartment outlet and a first compartment inlet, and a second compartment with a second compartment inlet and a second compartment outlet;
a first liquid circuit fluidly connecting the first compartment inlet to the first compartment outlet through the liquid reservoir and a first pump; and
a second liquid circuit fluidly connecting the second compartment outlet to the second compartment inlet through a second pump; and
a point of use fluidly connected to the outlet of the liquid reservoir, the point of use fluidly connected to a household distribution network including a connection to at least one of a sink faucet, a shower head, and a dishwasher.
2. (Previously Presented) The treatment system of claim 1, further comprising a first filter device fluidly connected to the first pump and to the liquid reservoir.
3. (Original) The treatment system of claim 2, further comprising a second filter device fluidly connected to the second pump.
4. (Canceled) ~~The treatment system of claim 1, further comprising a point of entry fluidly connected to the liquid reservoir.~~

5. (Canceled) ~~The treatment system of claim 1, further comprising a water distribution system fluidly connected to the liquid reservoir.~~
6. (Canceled) ~~The treatment system of claim 1, further comprising a point of use fluidly connected to the liquid reservoir.~~
7. (Original) The treatment system of claim 1, further comprising a sensor measuring at least one operating parameter of the treatment system.
8. (Previously presented) The treatment system of claim 1, further comprising a third liquid circuit fluidly connecting the liquid reservoir to the first compartment inlet and the first compartment outlet to the second compartment inlet.
9. (Previously presented) The treatment system of claim 1, further comprising a post treatment system fluidly connected downstream of the electrochemical device and upstream of the point of use.
10. (Previously Presented) A water treatment system comprising:
an electrodeionization device comprising a first compartment comprising a first compartment outlet and a first compartment inlet and a second compartment comprising a second compartment outlet and a second compartment inlet, the electrochemical device fluidly connected to a point of entry;
a water reservoir fluidly connected to the point of entry and to at least one of the first compartment inlet and the second compartment inlet;
a first pump fluidly connectable to the first compartment outlet and to the first compartment inlet;
a second pump fluidly connectable to the second compartment outlet and to the second compartment inlet;

a circulation line fluidly connectable to at least one of the first or second compartment outlets;

a point of use fluidly connected to an outlet of the water reservoir, the point of use comprising at least one of a sink faucet, a shower head, and a dishwasher; and

a household distribution network fluidly connecting the point of use to the outlet of the water reservoir.

11. (Original) The treatment system of claim 10, wherein the circulation line is fluidly connectable to at least one of the first and second pumps.

12. (Original) The treatment system of claim 10, further comprising a first valve fluidly connecting the circulation line to the first pump.

13. (Original) The treatment system of claim 12, further comprising a second valve fluidly connecting the circulation line to the second pump.

14. (Original) The treatment system of claim 10, further comprising a first valve fluidly connecting the first compartment outlet to the circulation line.

15. (Original) The treatment system of claim 14, further comprising a second valve fluidly connecting the second compartment outlet to the circulation line.

16. (Previously Presented) The treatment system of claim 15, further comprising a controller configured to actuate at least one of the first and second valves.

17. (Previously Presented) The treatment system of claim 10, further comprising a sensor configured to measure at least one operating parameter of the treatment system.

18. (Canceled) ~~The treatment system of claim 10, further comprising a water distribution system fluidly connecting the point of use and the water reservoir.~~

19. (Original) The treatment system of claim 10, further comprising a disinfectant source fluidly connectable to at least one of the electrochemical device, the circulation line, the first pump, and the second pump.

20. (Previously Presented) A method of treating water comprising:
establishing a first water circuit a first treated water stream flowing therein from a reservoir to a first compartment inlet of an electrochemical device through a first pump;
establishing a second water circuit having a first concentrating water stream flowing therein from a second compartment outlet of the electrochemical device to a second compartment inlet through a second pump;
establishing a third water circuit having a second-treated water stream flowing therein from the reservoir to the second compartment inlet through the second pump; and
delivering at least a portion of treated water from the reservoir to a point of use selected from the group consisting of a sink faucet, a shower head, and a dishwasher through a household distribution network.

21. (Previously Presented) The method of claim 20, further comprising establishing a fourth water circuit having a second concentrating water stream flowing therein from the first compartment outlet to the first compartment inlet through the first pump.

22. (Original) The method of claim 20, further comprising applying an electric field across the electrochemical device.
23. (Previously Presented) The method of claim 22, further comprising reversing a polarity of the applied electric field after establishing the third water circuit.
24. (Previously Presented) The method of claim 20, wherein establishing the third liquid circuit comprises actuating a first valve to direct the second treated water stream to flow through the second pump.
25. (Previously Presented) The method of claim 24, further comprising actuating a second valve to direct the second concentrating water stream to flow through the first pump.
26. (Previously Presented) The method of claim 20, further comprising measuring at least one of a pressure, temperature, flow rate, pH, conductivity and composition of one of the first treated water stream and the second treated water stream.
27. (Previously Presented) The method of claim 20, further comprising flushing the first and second compartments with the treated water.
28. (Previously Presented) The method of claim 20, further comprising flushing at least one of the first and second pumps with the treated water.
29. (Previously Presented) The method of claim 20, further comprising establishing a fourth water circuit having treated water from the reservoir flowing therein from the reservoir to the first and second compartments through the first and second pumps.

30. (Previously Presented) The method of claim 29, wherein the treated water from the reservoir has a negative LSI.

31. (Canceled) ~~The method of claim 20, further comprising delivering at least a portion of the treated liquid to a point of use.~~

32. (Previously Presented) The method of claim 20, further comprising post treating the treated water prior to delivering the treated water to the point of use.

33. (Previously Presented) The method of claim 20, further comprising disinfecting at least a portion of any component of any of the first water circuit, the second water circuit and the third water circuit.

34. (Withdrawn) A method of treating water comprising:
introducing at least a portion of water to be treated into a reservoir;
passing at least a portion of water to be treated through a first compartment of an electrodeionization device through a first pump to produce treated water;
introducing at least a portion of the treated water into the reservoir;
circulating a first concentrating stream through a second compartment of the electrodeionization device through a second pump;
circulating a second concentrating stream through the first compartment through the first pump;
applying an electric field through the electrodeionization device; and
reversing a polarity of the electric field.

35. (Withdrawn) The method of claim 34, further comprising passing at least a portion of the water to be treated through the second pump.

36. (Withdrawn) The method of claim 34, further comprising flushing the first compartment while flushing the second compartment.
37. (Withdrawn) The method of claim 34, further comprising flushing the first and second compartments and the first and second pumps with treated water sequentially.
38. (Withdrawn) The method of claim 34, further comprising passing the water from the reservoir through the first compartment after passing the water through the second compartment.
39. (Canceled) ~~A method of treating water comprising:~~
~~passing water to be treated through an electrochemical device to produce treated water;~~
~~storing at least a portion of the treated water in a water reservoir; and~~
~~flushing a concentrating compartment of the electrochemical device with the treated water.~~
40. (Canceled) ~~The method of claim 39, wherein the treated water has a negative LSI.~~
41. (Canceled) ~~The method of claim 39, further comprising flushing the depleting compartment.~~
42. (Canceled) ~~The method of claim 41, wherein flushing the depleting compartment is performed during flushing the concentrating compartment.~~

43. (Canceled) ~~The method of claim 39, wherein flushing the first compartment and the second compartment comprises flushing the first and the second compartment sequentially.~~
44. (Canceled) ~~The method of claim 39, wherein flushing the first compartment and the second compartment comprises flushing the first and second compartments with treated water in parallel flow.~~
45. (Canceled) ~~The method of claim 39, wherein flushing the first compartment and the second compartment comprises flushing the first and second compartments with treated water in series flow.~~
46. (Canceled) ~~The method of claim 39, further comprising exposing the treated water to actinic radiation or ozone.~~
47. (Canceled) ~~The method of claim 39, further comprising passing the treated water through a microfiltration or an ultrafiltration apparatus.~~
48. (Canceled) ~~The method of claim 39, further comprising exposing a disinfectant to at least one of the electrochemical device and the water reservoir.~~
49. (Previously Presented) A method of facilitating water purification comprising:
- providing an electrochemical device comprising a first compartment and a second compartment;
 - providing a first pump fluidly connectable to at least one of a water reservoir, a first compartment outlet and a first compartment inlet;

providing a second pump fluidly connectable to at least one of the water reservoir, a second compartment outlet and a second compartment inlet;

providing a circulation line fluidly connectable to at least one of the first and second compartment outlets; and

fluidly connecting the water reservoir to a point of use selected from the group consisting of a sink faucet, a shower head, and a dishwasher through a household distribution network.

50. (Canceled) ~~A treatment system comprising:~~
~~an electrochemical device comprising a first compartment and a second compartment;~~
~~means for flowing a liquid to be treated from a water reservoir through the first compartment and circulating a concentrating liquid through the second compartment; and~~
~~means for flowing the liquid to be treated from the water reservoir through the second compartment and circulating the concentrating liquid through the first compartment.~~

51. (Canceled) ~~The treatment system of claim 50, wherein the electrochemical device comprises an electrodeionization device.~~

52. (Withdrawn) A water treatment system for treating water from a point of entry, comprising:

a pressurizable reservoir having a reservoir inlet fluidly connectable to the point of entry, and a reservoir outlet fluidly connectable to a point of use;

an electrodeionization device fluidly connectable to the point of entry and to the point of use, the electrodeionization device having a first compartment with a first compartment inlet and a first compartment outlet, and a second compartment with a second compartment inlet and a second compartment outlet;

a circulation line fluidly connectable to the electrodeionization device;

a first valve fluidly connectable to the first compartment inlet and to at least one of the reservoir outlet and the circulation line;

a second valve fluidly connectable to the first compartment outlet and to at least one of the reservoir inlet and the circulation line; and

a controller configured to actuate the first valve to fluidly connect the reservoir outlet to the first compartment inlet.

53. (Withdrawn) The water treatment system of claim 52, further comprising a filter fluidly connected downstream from the reservoir outlet and upstream of at least one of the first compartment inlet and the second compartment inlet.

54. (Withdrawn) The water treatment system of claim 52, wherein the controller is further configured to actuate the second valve to fluidly connect the first compartment outlet to the reservoir inlet.

55. (Withdrawn) The water treatment system of claim 52, further comprising:

a third valve fluidly connectable to the second compartment inlet and to at least one of the reservoir outlet and the circulation line; and

a fourth valve fluidly connectable to the second compartment outlet and at least one of the reservoir inlet and the circulation line.

56. (Withdrawn) The water treatment system of claim 55, wherein the controller is further configured to actuate the second valve to fluidly connect the first compartment outlet to reservoir inlet; to actuate the third valve to fluidly connect the second compartment inlet to the circulation line; and to actuate the fourth valve to fluidly connect the second compartment outlet to the circulation.

57. (Withdrawn) A household water treatment system for treating water from a point of entry comprising:

a household water distribution system fluidly connected to at least one point of use selected from the group consisting of a sink faucet, a shower head, and a dishwashing machine;

a pressurized water reservoir fluidly connected to the point of entry and to the household water distribution system;

an electrodeionization device fluidly connected to the pressurized water reservoir, the electrodeionization device comprising a first compartment and a second compartment;

means for flowing water from the pressurized water reservoir to the first compartment and for circulating flow of a liquid through the second compartment;

a controller configured to regulate at least one operating condition of the means for flowing water from the pressurized water reservoir to the first compartment and for circulating flow of the liquid through the second compartment.

58. (Withdrawn) The household water treatment system of claim 57, further comprising at least one water property sensor configured to measure at least one physical property of water in the household treatment system selected from the group consisting of turbidity and alkalinity.

59. (Withdrawn) The household water treatment system of claim 58, wherein the sensor is operatively coupled to the controller, and wherein the controller is further configured to adjust at least one operating condition of the electrodeionization device based on the at least one measured physical property.

60. (Withdrawn) The household water treatment system of claim 59, further comprising at least one carbon filter fluidly connected downstream from the pressurized water reservoir and upstream of one of the first and second compartments.

61. (Withdrawn) The household water treatment system of claim 57, wherein the pressurized reservoir comprises a heating coil.